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LUNAR RECEIVING LABORATORY
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George J. Alexander

CONTAMINATION BACKWARD AND FORWARD

Article IX of the space treaty states that "parties to the treaty shall pursue studies of outer space, including moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose." Although the question of contamination is mainly one of scientific safeguards, a nation could be held internationally liable if it were to cause any contamination. The member states have agreed to conduct their activities so as to prevent contamination. However, no standard is established by which a state will be judged if it causes contamination.

After a tour of the Lunar Receiving Lab, it is apparent that they have taken elaborate precautions against the possibility of back contamination. The possibility of there being anything contagious was somewhere in the 10^{-8} power vicinity. To protect against this slight possibility the MSC has spent many dollars.

Lunar Receiving Lab

A. Background:

An Interagency Committee on Back Contamination has been established to insure the biological and chemical integrity of lunar samples and the experiments relating thereto. They are also responsible for protecting the public from any contamination from returning lunar astronauts or lunar exposed material. (See Attachment A, Background under Terms of Reference). This committee consists of the Department of Agriculture, Department of the Interior, Department of Health, Education and Welfare, the National Academy of Sciences and N.A.S.A. The responsibilities of the committee will be carried out primarily within the Lunar Receiving Lab. This structure at M.S.C. is biologically sealed and is as safe from contamination as present scientific knowledge will allow. The Committee has established elaborate procedures to prevent contamination from the splash-down to the quarantine of the men and materials at the lab, however, in this report, we are only concerned with the problems of the L.R.L.

B. Constitutional Authority for Federally Controlled Quarantine at the L.R.L.

When a federal agency partakes in a novel enterprise the first question raised is usually whether the Constitution allows such an agency to control this field to the exclusion of the states. Since the commerce clause grants the federal government control over commerce between the states and foreign nations, it would not be unrealistic to stretch the commerce clause to cover travel between planets. No doubt the framers of the Constitution never contemplated space travel when they granted the federal government control over commerce between foreign nations, yet the spirit of the commerce clause, which

the U. S. Supreme Court relied on so heavily in upholding the New Deal Legislation, should prevail here. The commerce clause was to be interpreted with the idea of protecting the free flow of commerce from state legislation which was often discriminatory and conflicting.

C. Who is Responsible for Controlling Contamination

It would seem from the "Purpose" paragraph at the beginning of the Interagency Agreement that the Committee would control contamination. However, the wording of the agreement and the attitudes of N.A.S.A. prevent it from being that simple.

The Interagency Agreement when describing the Committee's functions, always prefaces each paragraph with, "may advise" or "may recommend." (Attachment A, Functions S 4(a)(1-7)). Even the subparagraph specifying that this Committee is to advise the Administrator on policy matters as opposed to technical matters is not determinative of the question of quarantine control. (Attachment A, Functions S 4(c)). The reappearance of these words, "advise", "recommend" and "may" (Id. S 4(b)), weaken the proposition that the Committee has control of contamination.

N.A.S.A.'s feeling of control comes from the idea that the Space Act establishes their agency as the one responsible for all space activities; the astronauts are N.A.S.A. employees, the L.R.L. was built with N.A.S.A. appropriation funds, and is staffed by N.A.S.A. employees. Under all property and agency principles N.A.S.A. should have responsibility; yet they may contract to the contrary. The Interagency Agreement, to say the least, is not explicit on this matter. Therefore it is a matter of contract interpretation with due regard given to statutes outside the agreement.

The Management Instructions at M.S.C. and the Quarantine Schemes seem to support the supremacy of the Committee. M.S.C. I 8030.1 is appropriately titled "Assignment of Responsibility for the Prevention of Contamination of the Biosphere by Extraterrestrial Life." Under the heading "Background" there is a pertinent statement to the effect that "M.S.C. has the responsibility of taking all necessary precautions as required by these agencies to prevent such back contamination." As evidenced by the three Organizational Charts (pp 9-11) of the pamphlet on Quarantine Schemes the Committee has the final determination on the question of releasing astronauts or lunar samples. The Committee reviews all of the available data and proposes action before any release. Also when necessary, the Regulatory Agencies must give their formal clearance. The review of the data by the Committee is made after the N.A.S.A. medical team has made their recommendations in the case of astronauts.

The medical team is not mentioned in the two Quarantine Schemes for Returned Lunar Samples. This is certainly indicative of N.A.S.A.'s firm opinion that they have complete control of the astronauts, at least. (Interview with Dr. Wooley, p. 4). N.A.S.A. has some support for this feeling because the discovery of adverse defects would be easier to spot in a human being and therefore the medical team would have much more influence. However, even the Committee has a check on the medical team here.

One of the biggest checks the Committee has is the fact that M.S.C. must follow any necessary precautions required by the Committee (M.S.C. I 8030.1). If the Committee grants a conditional release, the conditions must be met before release. Further, if the problem can be identified as one falling within one of the areas regulated by the three regulatory agencies they

must give formal clearance. The applicable regulations are set out in a pamphlet published by the Committee. The problem is that there will probably be so many unknowns involved that it will be very difficult to pigeon-hole the problem so as to give a particular agent specific authority. Perhaps herein lies the main reason for the combination of these agencies into one committee on back contamination. Recognizing the mystery involved with diagnosing elements which are completely unknown to us and also the fact that these three agencies' authority overlaps in some areas, it would be wise to combine them in Committee with final authority. (For example, note the continuous dispute between Interior and Agriculture over who controls our forests.)

This theory is much more palatable than asserting that N.A.S.A. gathered the agency representatives together merely for their expertise, never intending to give them final authority. N.A.S.A. must recognize that the included agencies derive their authority to protect public health from federal regulations which are binding regardless of any Agreements entered into by these agencies. This Committee should be accorded a formal recognition of the already existing power of their respective regulatory agencies.

There was much consternation among the Committee members when a publication about the Committee was released by N.A.S.A., titling the group as the Advisory Committee on Back Contamination. The Committee was afraid this indicated an erosion of their policy setting power. However, N.A.S.A. assured them that they were indeed more than an advisory board and the addition of the word "Advisory" was immaterial. (Interview with Dr. Wooley, pp 5-6). The above interchange typifies the vagueness which surrounds this whole Agreement.

D. Voting Procedures within the Inter-Agency Committee

The lack of any statement as to how voting will be conducted within the Committee is another reason why the responsibility for contamination is a cloudy issue.

Since there has only been one non-unanimous decision by the Committee to this date, the lack of voting procedures in itself is not important. (Interview with Dr. Wooley, p. 1). However, if the procedures were set out, they might provide a conclusive argument for who has control of contamination.

Almost any theory on the voting structure can be supported by the vague language in the Agreement. The simplest method would be to give each of the eleven members one vote, thereby giving N.A.S.A. a clear majority of six. If this were done the previous conclusion that N.A.S.A. had relinquished final authority over the quarantine would be doubtful.

This theory of one vote per member, presupposes that a simple majority rules. Majority rule is suggested by the requirement that in case of non-unanimous decision all dissenters must file a report on why they disagree even though these reports may be combined. This is analogous to majority and dissenting minority opinions in legal decisions.

Another feasible theory is that each agency has one vote regardless of the number of representatives on the Committee. In this case the Public Health Department and N.A.S.A., since they are the only two agencies with more than one representative, would have to set up some intra-voting procedure which would determine how the one vote for the agency would be cast. This theory would be more in line with the idea that the Committee has the final

authority over the quarantine.

In an interview with Dr. Wooley, L.R.L. Biomedical Coordinator, he stated that it was unlikely that N.A.S.A. would overrule the other four agencies even if they had the power. Perhaps with this attitude in mind the previous discussion is academic.

E. Quarantine Control Officer - Enforcer or Inspector

If a person within the quarantine were to deviate from set procedures who would have the authority to physically restrain him and if necessary incarcerate him? This is indeed a problem which bears consideration when one considers the conditions, length and possibility of extension of the quarantine.

In the booklet on Quarantine Schemes for Manned Lunar Missions under the heading of "Contingency Landings" N.A.S.A. mentions that in case of a landing other than that programmed for the flight the quarantine aspects would be handled by a Quarantine Control Officer. He is supposed to consult with the Committee to the extent possible before putting disaster control procedures into effect. This officer is also supposed to draw up ahead of time and have approved a document outlining typical courses of action for several types of contingency landings. He is expected to have the power to make immediate authoritative decisions as to quarantine and back contamination as well as other time-critical problems.

In the Management Instruction, M.S.C. indicates that the Public Health Service will designate a Quarantine Officer who will be responsible for such surveillance of the execution of quarantine procedures as the Public Health Service may require to carry out its regulatory responsibilities. (No mention

is made of the officer's authority being limited to contingency landings or other emergencies.)

According to the minutes of the June 11th meeting of the Committee, the Committee discussed the question of creating a full time quarantine control officer. They felt that a better title would be a "Quality assurance-like" person. The Committee recommended that the M.S.C. hire such a person and develop a detailed job description. They further stated that this person would report his findings to the Committee through Dr. Berry and he would be the person to work in concert with the Department of Agriculture and Public Health Department inspectors when they are required at the Lunar Receiving Lab.

The above is a chronological sequence of the creation of the position of Quarantine Control Officer or quality assurance person. Some of the changes in the development of this position's authority or source of authority should be noted.

It seemed originally that this officer was to take charge only if the landing were other than normal. However, the M.S.C. Management Instructions call on Public Health Service to designate the officer and it appears that he will be generally available as a watchdog. No mention of contingency landing is made. The latest minutes of the Committee indicate that the position has not been filled yet but that, when appointed, this person will perform a necessary policing function. M.S.C. also wants to change his name to a quality assurance-like person. A detailed job description is in the making. However, it seems now that the M.S.C. has taken over responsibility of appointing the person for this position although their description of his tentative duties is closer to the description in the M.S.C. Management Instruction. He will,

however, work under M.S.C. and in concert with Department of Agriculture and Public Health Service inspectors and not be answerable directly to the Public Health Service as indicated in the M.S.C. Management Instruction.

The language in the minutes of the 6/11/68 meeting of the Committee strongly supports the idea that this person would be the enforcer in the event of any violation of set procedures. It remains to be seen if he will have the authority physically to restrain disruptive activities. Perhaps the detailed job description forthcoming from M.S.C. will clarify his exact authority. This theory of the enforcer is supported by the section in the minutes that tells about Dr. G. Biggs Phillips being appointed as consultant to Space Medicine and the Interagency Committee. The minutes mention that Dr. Biggs is to be a true advisor on matters of quarantine and containment and that he is to function as the "opposite number" to the quality assurance individual in relation to the membership of the Committee. This language indicates that Dr. Biggs would serve in a strictly advisory committee and the quality assurance man will be an enforcer of the rules with authority over anyone who breaks them.

Dr. Wooley informed us that the Quarantine Control Officer would be an overseer of the operations and the chief executive assistant to the person in charge of the operations in his connection with all other groups involved in the quarantine. His main responsibility would be preserving the integrity of the quarantine at the transfer or breaking points. His only express enforcement powers would stem from his duty to see that all of the Committee's recommendations are carried out.

The position of enforcer will actually be fulfilled by a guard who will be stationed by the entrance. Such a guard would be aware that if

there is trouble inside he will enter and perform the function of a policeman. He will be an employee of an outside contractor and once inside he would not come out until the quarantine was lifted.

F. Federal Intervention with the Quarantine Scheme

A quarantinee who applies to a federal court for release from the quarantine before it is lifted has to show some arbitrariness on the part of the agency decision. The burden of proof is initially on the quarantining officials to show that there is probable cause of a communicable disease. (Ex parte King, 16 O2d 694). The first problem which arises with this standard is how are the health officials going to show communicability if they don't know anything about the disease. The problem of unknown diseases runs throughout the entire quarantine scheme.

Once probable cause has been shown the burden of coming forward shifts to the petitioner. He may attack the quarantine on the ground that it has gone beyond the scope of necessary protection. (In re Smith, 40 N.E. 497). This would be a viable claim in the situation of an extended quarantine. The Committee has set out the conditions under which the quarantine may be extended, yet the astronaut's personal rights must be considered also. This quarantine scheme is not a binding contract on the astronauts and even if it was they could still petition the court to force the committee to justify the extended quarantine.

Quarantine is a preventive measure not a cure or an excuse for scientific experiment. (People v. Robertson (134 N.E. 815)). Scientific experiments on humans is not inherently illegal, yet consent certainly is a

requirement before commencement. One may not be isolated against his will solely for purposes of curing him. Therefore, the justification for the quarantine or extension of it must be the protection of the public.

One may be denied due process if health officials have a reasonable belief that a communicable disease exists. The suspect may be arrested and detained without a hearing. However, he is always entitled to a review of the quarantine order by the courts. It is not an unconstitutional denial of personal liberty if a hearing is available even if after the fact, when the public safety demands quick action.

G. State Court Interference with Quarantine Proceedings

The thought of a local sheriff appearing at the L.R.L. with a habeas corpus writ for the release of someone therein has caused only momentary anxiety. It is settled that "... state courts possess no power to enjoin a federal official or to remove any person from the jurisdiction of the federal officials or courts, through the writ of habeas corpus." That the people in the quarantine are under the jurisdiction of federal officials is not questionable. (43 Harv. L. Rev. 345).

A government agency acting within its scope of authority is independent of state action. (Keely v. Sanders, 99 U.S. 441 (1879)).

Also it has been held that state courts have no authority to issue writ of habeas corpus for the release of persons held under the authority or claim and color of authority of the United States. (Farble's Case, 13 Wall 397).

No matter what label is attached to the theory it is quite clear that a state court could not order the release of anyone in quarantine.

G.1 Additional Information on State Interference with Quarantine Scheme

Under our dual system of government, it is settled that the court which first takes jurisdiction of the subject matter of the litigation, whether this be person or property, retains it to the exclusion of the other until its duty is fully performed and the jurisdiction invoked is exhausted. (*Commonwealth v. Domanski*, 123 N.E.2d 368).

A state court, or judge, who is authorized by the laws of the state to issue the writ of habeas corpus may issue it in any case where the party is imprisoned within its territorial limits, provided it does not appear when application is made that the person imprisoned is in the custody under the authority of the United States (*Ableman v. Booth*, 21, How. 506-526).

Where writ of habeas corpus is brought before state court on behalf of a federal prisoner in order to release him and thwart or nullify proceedings in federal courts, the state court does not acquire any jurisdiction even though prisoner is before that court in compliance with the writ, but a federal prisoner may, on principles of comity, be turned over to state authorities for trial, since the federal government may, if it sees fit, waive its rights to the exclusive jurisdiction of such prisoner and consent to his being tried in the state court. (*Commonwealth v. Domanski*, 123 N.E.2d 368.)

Interview with Dr. Bennie Wooley, Lunar Receiving Laboratory Biomedical Coordinator

Question I: How will the six N.A.S.A. representatives vote on the eleven man Interagency Committee?

Dr. Wooley: In the past there has only been one non-unanimous recommendation by the Committee. This one decision involved the use of a certain chemical which one of the N.A.S.A. representatives thought was not the best one for the purpose intended. He voted "no," but did not publish any report supporting his decision. Most of the decisions of the Committee are thoroughly discussed and unanimous approval is usually assured before a vote is taken.

The question of whether majority rules in the vote by the Committee is not settled by the agreement. It would appear that majority would rule since in the absence of unanimous agreement every designated representative must file a report even though agencies can combine their reports. This sounds like the majority and dissenting minority found in legal opinions. These reports are to be filed so as to clarify how each agency stands on the questions. A report filed by a designated representative is considered to be the official opinion of that agency.

The agreement states that the head of each interested agency shall designate an official or officials to be their designated representative or representatives. There is no indication whether each designated representative will have a vote or not, nor what an agency with more than one representative will do when their representatives disagree and file differing reports. Whose report binds the agency? How are intra-agency representatives to decide which opinion will be their official one?

Interview with Dr. Wooley - 2

There are only two agencies that have more than one representative: N.A.S.A. with six, and the Department of Public Health with two. Suppose four N.A.S.A. representatives vote one way and two the opposite. Would the majority within NASA rule and the opinion of the four bind the whole agency or would these four votes only bind the departments within N.A.S.A. which they represent?

Besides the question of which opinion will be considered as NASA's official opinion there is the question of N.A.S.A. controlling the vote of the Committee if we abide by majority rule and let each individual have a vote. NASA would have a clear cut six out of eleven majority on the Committee. NASA could determine its policy beforehand and always be assured of a majority approval unless one of their members votes other than planned.

An alternative voting procedure which the agreement does not discredit is that each agency has one vote and the representatives must agree among themselves how it will be cast. (Sort of like unit rule even though it is not popular in Texas anymore.)

Dr. Wooley indicated that N.A.S.A. is not likely to over-ride the other four agencies even if they theoretically have the power.

Interview with Dr. Wooley - 3

Question II: In the pamphlet on Quarantine Schemes for Manned Lunar Missions, the structures in the back show that before the final decision the Interagency Committee may review the data and the proposed action and also there must be formal clearance by the regulating agencies, when necessary. What does formal clearance mean?

Dr. Wooley felt that formal clearance meant a release signed by all members when the problem came within their jurisdiction as shown by the federal regulations granting them power to control certain dangerous disease problems. This brought up the much more important question which was really what I was aiming at and that is; who has the final say on the release of samples and astronauts? Dr. Wooley indicated that at present, the N.A.S.A. people feel that the astronauts and samples are under their complete control. This does not appear to be the case. If there is a dispute over the release of some samples, for example, and the Department of Agriculture states that they will release these samples only on certain conditions, this is the conditional release seen in the structures of the quarantine scheme. If the agriculture department can show the conditions upon which they base release concerns something that is under their jurisdiction, then if N.A.S.A. will not meet their conditions, N.A.S.A. cannot release the samples. Therefore, only if the other agencies are in agreement may N.A.S.A. claim they have final authority. The Committee is still an advisory board to the administrator of N.A.S.A.; however, individual agencies have power under the federal code to protect the public from contagious diseases. If in the process of protecting the public an agency must exercise its power over N.A.S.A. then the advisory nature of the agreement will not stop them.

Interview with Dr. Wooley - 4

The responsibilities of the M.S.C. are set out in M.S.C. I 8030.1 1/9/67 as to clearly support this theory. This management instruction from the Director of M.S.C. clearly shows that M.S.C. has the responsibility of taking all necessary precautions as required by these agencies to prevent back contamination. This document also states that Dr. Berry, Director of Medical Research and Operations, who is responsible for all efforts at M.S.C. to prevent back contamination, will be fully responsive to these requirements. This is only a M.S.C. management instruction but from the tone of the Quarantine scheme and this, it would seem that N.A.S.A. itself agrees with the theory of responsibility to the conditions prescribed by these different agencies.

There was some concern among the Committee members when a directive came out a while ago which called the group "The Advisory Committee on Back Contamination" instead of just the "Committee on Back Contamination". The Committee felt that this might be an erosion of their policy setting power. N.A.S.A. assured the Committee that they were more than an advisory board and the addition of the word "Advisory" to the name of the Committee was immaterial.

Interview with Dr. Wooley - 5

Question III: What are the duties of this quality control officer mentioned in the minutes of the June meeting?

Dr. Wooley: This position will be considered a staff officer of N.A.S.A. working under Dr. Berry. The policing function mentioned in the minutes that this officer would be fulfilling is in the nature of an overseer rather than an enforcing type of policing function. He will be Dr. Berry's connection with all the other groups involved in the quarantine. His function will be primarily to maintain the integrity of the quarantine, especially at transfer or breaking points. In other words, when material or astronauts are being transferred from one department's or agency's jurisdiction. For instance when the astronauts leave the capsule to enter the vans which will take them to the Lunar Receiving Lab, the Quality Control Officer will make sure in advance that all the procedures comply with any precautions recommended by Committee members. He will also check to see that the plans are adequate for maintaining the purity of the lunar experiments. The procedures must cover all contingencies. He is a policeman in the sense that he is responsible for coordinating N.A.S.A.'s activities with any requirements legitimately imposed on them. He does not formulate policy, but checks to make sure the policy is abided by.

Dr. Wooley stated that this man would not be the cop or enforcer on the inside that we were wondering about. In other words, he would not have the authority to physically restrain a person who was deviating from set procedure. It appears that this type of enforcement would be performed by a security guard who is on the outside guarding the entrance. This guard would be aware that if necessary he would have to go inside and stay until the quarantine ended. The guard would be considered an agent of an outside contractor and therefore, have signed a separate contractual agreement with N.A.S.A.

**QUARANTINE SCHEMES
FOR
MANNED LUNAR MISSIONS**

BY: INTERAGENCY COMMITTEE ON BACK CONTAMINATION

N A S A

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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QUARANTINE SCHEMES FOR MANNED LUNAR MISSIONS

Introduction

Presented herein are the fundamental quarantine and sample release plans for manned lunar missions as established by the Interagency Committee on Back Contamination. Obviously, the scheme does not contain all possible finite technical details about quarantine test methods and containment provisions, but it provides the necessary framework for action by the Interagency Committee on Back Contamination and substantive methods for satisfying the quarantine requirements of the Regulatory Agencies.*

It is, of course, impossible in any set of quarantine plans to anticipate every eventuality. Therefore, it is necessary that the schemes include a contingency provision that gives the Interagency Committee and the Regulatory Agencies adequate opportunity to provide requirements and suggestions for situations not covered in the formal plans. It is likewise necessary to emphasize that in spite of efforts being made to assure aseptic collection and return of lunar samples, there is no certainty of the complete absence of earth microbial contaminants. And certainly, the potential of earth contaminants in returned lunar sample will be significantly greater after the first Apollo mission.

Astronaut Release Scheme

Table I provides the general scheme for the quarantine and release of the astronauts and medical support personnel in the Crew Reception Area (CRA) of the Lunar Receiving Laboratory (LRL). The scheme covers three possible results and indicates the course of action for each. Implicit in each is an appropriate review by the Interagency Committee and the accomplishment of any formal action and recommendation that might be required.

Proposition I is the most likely with release of the astronauts and medical support personnel from the CRA after approximately 21 days. This action will accrue if there are no alterations in the general health of the quarantined people and no other indications of infectious disease due to lunar exposure.

*In this document the U. S. Department of Health, Education and Welfare, the U. S. Department of Agriculture, and the U. S. Department of the Interior are referred to as the Regulatory Agencies.

Should a definite alteration in the health of one or more persons in the CRA occur (Proposition II), release of the people would probably not be delayed if the alteration is diagnosed as non infectious or is of terrestrial origin. If the source of the alteration cannot be readily diagnosed, however, some prolongation of the quarantine may be necessary. In either case, under Proposition II, review of the data and recommendations by the Interagency Committee are required.

Proposition III established the requirement that laboratory personnel from the sample laboratory of the LRL be housed in the CRA following a severe rupture of a cabinet system containing lunar material suspected of containing harmful or infectious materials. While precise specification of events for Proposition III are not outlined in Table I, the NASA medical team should consider all available information and make recommendations concerning release of the laboratory people. These recommendations should be reviewed and approved by the Interagency Committee. If it is decided that the laboratory personnel must undergo quarantine, the medical observations would identify Propositions I and II in Table I. It must be recognized that this situation could result in prolonged quarantine of the astronauts.

Phase I Sample Release Scheme

The scheme outlined in Table II provides a general plan for each of three sets of circumstances resulting from quarantine testing of lunar samples. Examination and review of the quarantine data by the Interagency Committee before release or non release of the sample is provided in each case. In other words, in each case the Interagency Committee would have identified an appropriate time for coordinating their position and making their recommendations to the National Aeronautics and Space Administration.

Proposition I of Table II shows the course of action for what should be the most probable result of sample quarantine testing, the situation in which the protocol is carried out in the LRL with completely negative results: no viable organisms being isolated and no pathogenic effects being noted in the animals and plant systems tested. For this eventuality, Proposition I calls for the Interagency Committee to meet, examine, and review the quarantine data, and if satisfied as to its validity and reliability, recommend to NASA the release of samples from that returned mission. Formal clearance by the Regulatory Agencies is effected as a part of this plan.

Proposition II of Table II prescribes the course of action to be followed in the event that a replicating organism is detected in the lunar sample without any deleterious effects being noted on the life systems or terrestrial niches tested in the LRL. Should this result materialize, the aim of the

flow chart under Proposition II is to determine: (1) if the organism isolated is of terrestrial origin, unmodified by any lunar exposure and generally considered as "non pathogenic", or (2) if the organism is not readily classified as being of terrestrial origin and therefore of potential hazard to terrestrial ecology.

In regard to statement (1) above, demonstration that the organism in question is identical with organisms collected from the spacecraft, from spacecraft equipment, or from the astronauts during preflight sampling, or classification of the organism as a harmless terrestrial microbe would be adequate reason for neither extending nor expanding the quarantine. The inability to recover a common, identifiable, and non pathogenic organism a second time from a duplicate lunar sample would further indicate that an earth contaminant rather than an organism indigenous to the lunar sample was involved. In this same regard, lunar sample contamination could result following a break in the primary barrier of the LRL. If the organism isolated cannot be readily classified or otherwise shown to be of terrestrial origin, there then would be the need for initiation of a contingency quarantine plan.

Under Proposition II, Table II, the scheme requires review by the Interagency Committee at the points indicated. Adequate demonstration that the organisms are terrestrial, unchanged, and usually regarded as "non pathogenic" would be considered by the Interagency Committee as sufficient reason for not requiring challenge of additional terrestrial niches before sample release. Failure of the protocol tests to provide this information about organisms isolated from the lunar sample, however, would signal the need for further quarantine testing (indicated as Phase II quarantine) and/or release of sample according to conditions* then specified by the Regulatory Agencies, and/or release of samples after sterilization.

Proposition III of Table II covers the situation where definite deleterious effects are noted on one or more of the life systems tested in the LRL. Should this occur, the effects observed may be due to chemical toxicity rather than to invasion by a replicating organism. This would be indicated if sterilized lunar material (the control) produced the same deleterious effects and if no replicating organisms were found. It is always possible, however, that replicating contaminants will be uncovered along with a toxic chemical. In such cases,

*Release to certain specified laboratories for further study; or sterilization before release, but only after consultation with investigators to determine if this is satisfactory to their specific experiment; or release to the LRL so that visiting scientists (Principal Investigators) can work in the LRL under containment conditions to carry out early experiments.

it will be necessary to identify the organisms as of terrestrial origin and to classify them as "harmless" in order to avoid testing additional terrestrial niches or life systems.

Finally, if replicating organisms are indicated as the cause of definite deleterious effects on tested life systems, Phase II quarantine will be indicated with the possibility of a subsequent conditional release and/or only sterilized samples will be released. Under Proposition III appropriate places for review and action by the Interagency Committee are indicated.

Phase II Sample Release Scheme

The probability is very remote of a contingency quarantine of a lunar sample due to the presence of unidentified replicating organisms or because of non-explained deleterious effects on life systems that are not due to chemical toxicity. Nevertheless, it is necessary that the prevention of possible terrestrial back contamination be specific with regard to these remote probabilities in order that the intent of the Interagency Committee on Back Contamination Terms of Reference* be fulfilled and that the legal requirements of the Regulatory Agencies be satisfied. The Phase II quarantine scheme for these eventualities is specified in Table III.

Phase II requires a prolongation of the quarantine for an unspecified time interval. However, even at the outset of Phase II, the Interagency Committee could recommend release of some portions of the lunar samples to non-biological institutions under specific conditions of handling. The conditions would, for the most part, relate to the use of the sample inside biological barriers.

Otherwise, Phase II quarantine involves continued testing of animal and plant species in the LRL. As indicated in Table III, the scheme could also provide for conditional release of cultures isolated in the LRL or specimens to certain biological laboratory institutions in the United States for more detailed study of possible pathogenic effects. These laboratories, however, must meet existing specifications of the Regulatory Agencies for handling potentially virulent pathogens.

*Interagency Agreement between the National Aeronautics and Space Administration, the Department of Agriculture, the Department of Health, Education and Welfare, the Department of the Interior, and the National Academy of Sciences on the protection of the Earth's biosphere from lunar sources of contamination: Attachment A: Interagency Committee on Back Contamination Terms of Reference.

(Phase II quarantine could take advantage of visiting scientists in the LRL as bioscience specialists to carry out specific tests for pathogenicity, should such talents be available.)

Contingency Landings

The release schemes outlined above assume that a nominal or near nominal landing of the crew, spacecraft, and related equipment has been achieved. In the event of a contingency landing -- off nominal -- the details and method of quarantine must be adapted to the exigencies of the situation. Immediate authoritative decisions must be made as they apply to quarantine and back contamination as well as other time critical problems.

For such cases, the quarantine aspects will be represented by a Quarantine Control Officer.* To the extent possible during a disaster, he will obtain direction from the Regulatory members of the Interagency Committee before initiating disaster control procedures. Prior to the first returned lunar mission it will be the responsibility of the Quarantine Control Officer to prepare and have approved by the NASA medical team and the Science and Applications Director (Manned Spacecraft Center), and the Regulatory Agencies a document outlining typical courses of action for several types of contingency landings.

Release of Film and Data Tapes

The film and data tapes will be returned to the LRL in the same manner as the lunar samples, admitted to quarantine, and maintained behind a biological barrier. The data tapes will then be played through the biological barrier for outside processing.

The film will be processed inside the quarantine facility and printed through the biological barrier with an optical printer for outside use.

If current studies indicate that ethylene-oxide sterilization of the film is possible when the film is contaminated with bacterial spores and that no degradation of the film occurs, there is the possibility that immediate release of sterilized film will be allowed without printing through the barrier. The statistical reliability of the ethylene-oxide process should be such that the treatment will fail to give sterility no more than 1 in 10,000 times ($P=1 \times 10^{-4}$).

*Manned Spacecraft Center Management Instruction 8030.1 dated January 9, 1967: Assignment of Responsibility for the Prevention of Contamination of the Biosphere by Extraterrestrial Life.

Spacecraft Release

The spacecraft will enter the LRL in a sealed configuration and be placed in isolation near the CRA (this area can become a part of the quarantine facility if necessary). It will follow the same time constraints as the sample -- 30 days -- prior to release if all results are negative. It will, however, be available for additional bio-sampling if deemed necessary by the Quarantine Control Officer. At his discretion, it may also be entered for technical inspection provided that it is placed inside the biological barrier and the personnel and spacecraft become an integral part of the quarantine facility and scheme of release at that time.

Summary

The Interagency Committee has prepared this document in order that all agencies and persons involved in returned lunar samples may have a clear understanding of the procedures the Interagency Committee feels are necessary for the realistic program to protect this planet from possible contamination. Moreover, the Interagency Committee presents this document as one that will satisfy the requirements of the Regulatory Agencies of Government without undue hardship on NASA. Although the Interagency Committee feels that very few alternates to this plan are possible, it wishes to acknowledge a speedy and unconditional release of the sample; a minimum of expense and delay is highly advantageous to the scientific community.

The schemes proposed may be summarized as follows:

1. Astronauts and Medical Support Personnel

a. Release after 21 days if no alterations in general health are observed and in the absence of an infectious disease attributable to lunar exposure.

b. If significant alterations in general health occur, release is still indicated if alterations are diagnosed as of terrestrial origin or as non communicable.

c. If alterations are apparent and not diagnosed, some delay in release would be indicated with the final action to be recommended by the NASA medical team.

2. Conditions for Lunar Sample Release

a. It is expected that prompt release of lunar samples after completion of the protocol tests can be recommended by the Interagency Committee to the Administrator of NASA or NASA's designated representative. The nominal results expected would obviously not impose any unusual conditions upon the release.

b. Interagency Committee conditional release could result if there is sufficient doubt regarding the presence of pathogenic organisms in the lunar samples. In this instance, release of sterilized samples would be possible, or some samples might be released providing they are used only behind a suitable biological barrier. In the case of a conditional release, Phase II quarantine testing will proceed as rapidly as possible in an attempt to clarify the data regarding possible pathogenic effects.

3. Validity Constraints for Sample Release

It is in the interest of all concerned that the quarantine testing procedures be designed to avoid events that would produce invalid results. To insure that "lunar pathogens" will not be falsely detected, the sample release scheme contains the following constraints.

a. If replicating organisms are found in the sample and no deleterious effects are noted in any of the terrestrial niches tested in the LRL, release will not be delayed beyond the time needed to identify the organisms as terrestrial contaminants.

b. If deleterious effects from lunar material are noted with the terrestrial life systems tested in the LRL, release will not be delayed beyond the time needed to show that the effects were due to chemical toxicity and that any replicating organisms isolated from the sample were of terrestrial origin, harmless, and not responsible for the effects.

c. Should Phase I quarantine procedures indicate the presence of a substance pathogenic to terrestrial life, Phase II procedures will be initiated to verify or more adequately explain the Phase I results.

INTERAGENCY COMMITTEE ON BACK CONTAMINATION

Membership

Primary

David J. Sencer, M. D. (Chairman)
National Communicable Disease Center
U. S. Public Health Service

Dr. John Bagby, Jr. (Co-Chairman)
National Communicable Disease Center
U. S. Public Health Service

Dr. Wolf Vishniac
University of Rochester
(National Academy of Sciences
Representative)

Dr. Ernest Saulmon
Department of Agriculture

Mr. Howard H. Eckles
Department of the Interior

Dr. Harold P. Klein
Ames Research Center, NASA

Charles A. Berry, M. D.
Manned Spacecraft Center, NASA

Dr. Wilmot N. Hess
Manned Spacecraft Center, NASA

Mr. Lawrence B. Hall
Office of Space Science and
Applications, NASA

Dr. James Turnock
Office of Manned Space Flight, NASA

Colonel John E. Pickering
(Executive Secretary)
Office of Manned Space Flight, NASA

Dr. G. Briggs Phillips
U. S. Public Health Service Consultant

Alternate

Dr. Allan Brown
University of Pennsylvania

Dr. A. B. Park
Department of Agriculture

Dr. John Buckley
Department of the Interior

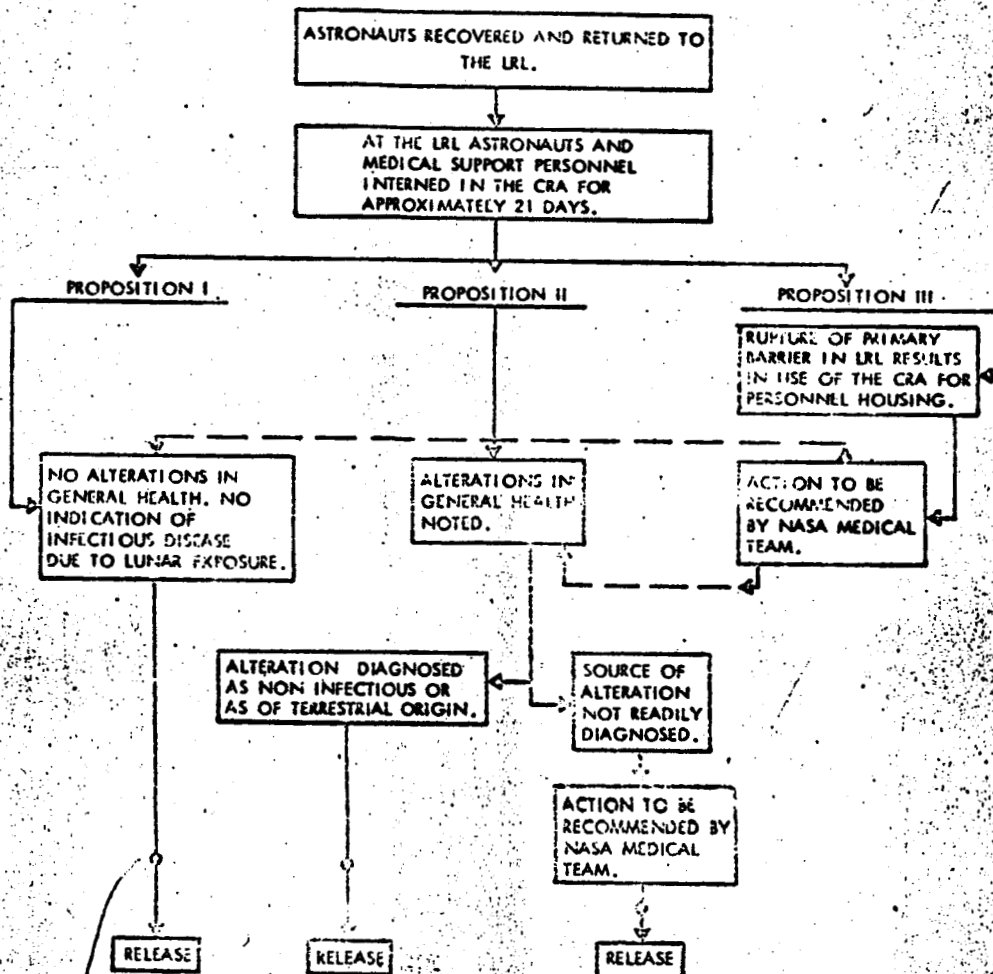
Dr. Adrian Mandel
Ames Research Center, NASA

Walter W. Kenmerer, M. D.
Manned Spacecraft Center, NASA

Mr. Joseph V. Piland
Manned Spacecraft Center, NASA

Captain Arthur H. Neill
Office of Space Science and
Applications, NASA

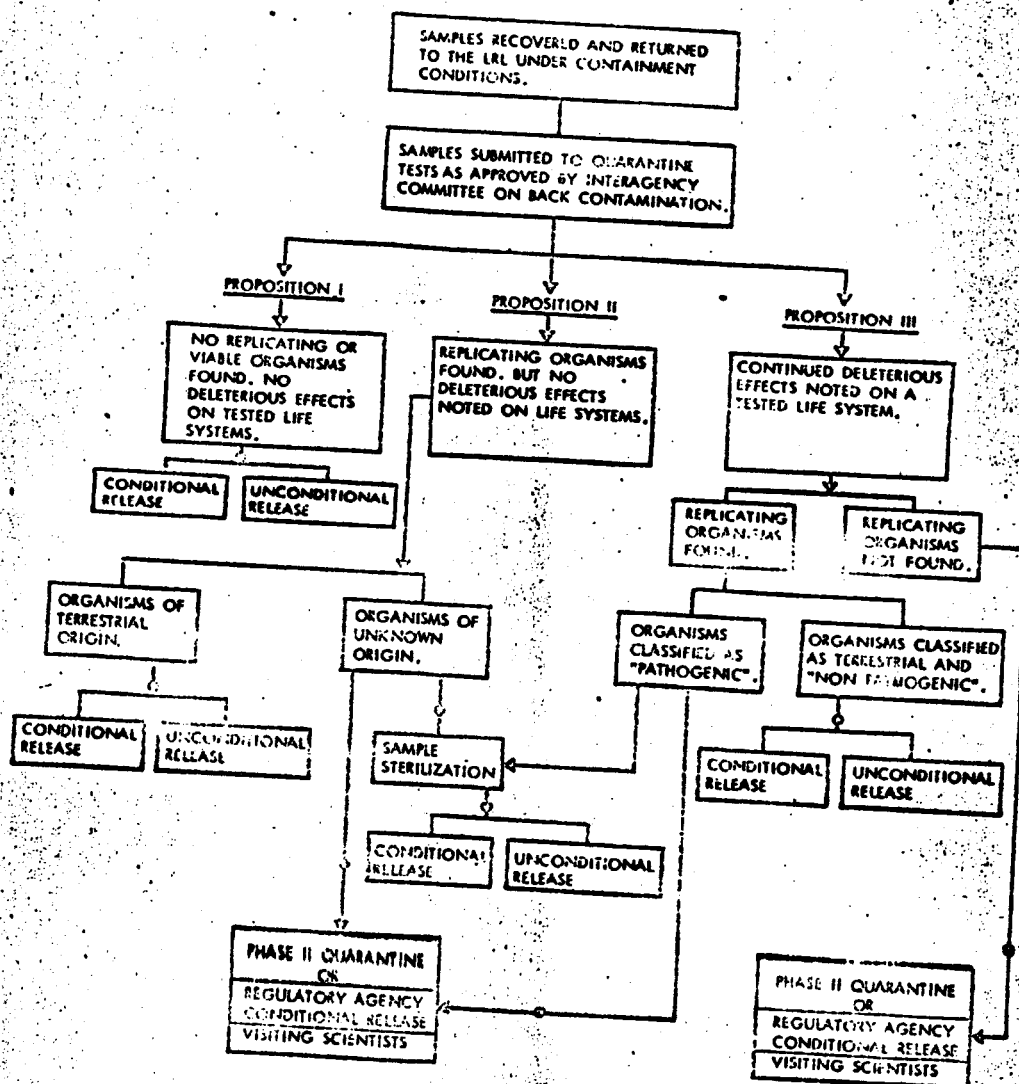
TABLE I. ASTRONAUT QUARANTINE SCHEME FOR MANNED LUNAR MISSIONS



⊙ INDICATES:

- (A) REVIEW OF DATA AND PROPOSED ACTION BY THE INTERAGENCY COMMITTEE ON RACK CONTAMINATION, AND
- (B) FORMAL CLEARANCE BY THE REGULATORY AGENCIES, WHEN NECESSARY.

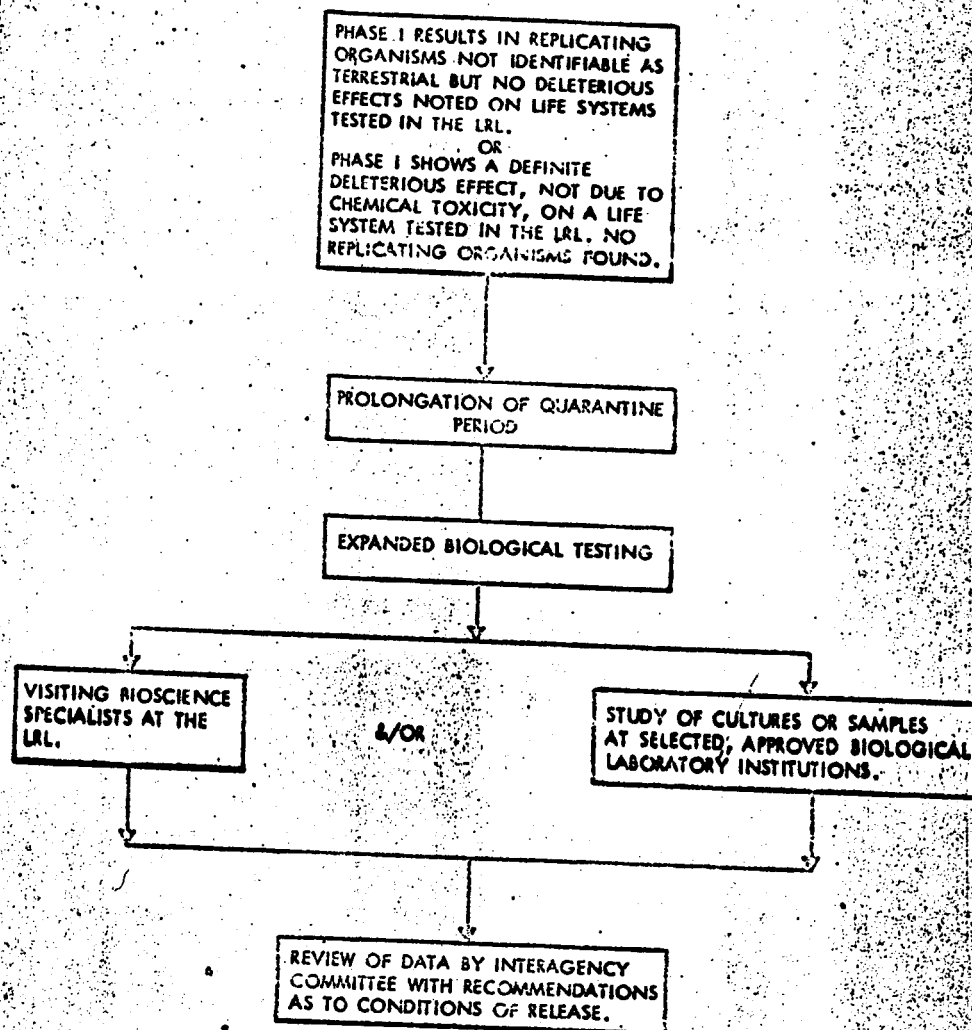
TABLE II. QUARANTINE SCHEME FOR RETURNED LUNAR SAMPLES (PHASE I)



○ INDICATES:

- (A) REVIEW OF DATA AND PROPOSED ACTION BY THE INTERAGENCY COMMITTEE ON BACK CONTAMINATION, AND
- (B) FORMAL CLEARANCE BY THE REGULATORY AGENCIES, WHEN NECESSARY.

TABLE III. QUARANTINE SCHEME FOR RETURNED LUNAR SAMPLES (PHASE II)



ATTACHMENT A

INTERAGENCY COMMITTEE ON BACK CONTAMINATION

Terms of Reference

1. Background

In developing the Apollo Lunar Program, the National Aeronautics and Space Administration recognizes that it must draw upon the specialized knowledge and experience of certain other agencies in order to protect the public's health, agriculture, and other living resources against the possibility of contamination resulting from returning lunar astronauts or lunar exposed material, and to preserve the biological and chemical integrity of lunar samples and the scientific experiments relating thereto with minimal compromise of the operational aspects of the Program. Therefore, pursuant to arrangements with the Secretary of Agriculture, the Secretary of the Interior, the Surgeon General, Public Health Service, and the President of the National Academy of Sciences, there has been established an Interagency Committee on Back Contamination.

2. Definitions

As used herein:

- a. The term "Administrator" means the Administrator of the National Aeronautics and Space Administration or his designee.
- b. The term "back contamination" means direct or indirect contamination of the Earth's biosphere, by matter of lunar origin, resulting from a manned lunar mission.
- c. The term "lunar sample" means material returned from the surface or subsurface of the moon.
- d. The term "lunar astronaut" means an astronaut who has been exposed, directly or indirectly, to the lunar surface.
- e. The term "lunar exposed material" means:
 - (1) matter of any kind, including spacecraft and mission-related equipment, which has been exposed to the lunar surface, and
 - (2) any person, animal, or matter of any kind who or which has been exposed to:
 - (a) a lunar astronaut, or
 - (b) matter which has been exposed to the lunar surface,

3. Membership and Officers

- a. The Committee shall consist of eleven members as follows:
 - (1) One representative of each of the following agencies:
 - (a) The Department of Agriculture
 - (b) The Department of the Interior
 - (c) The National Academy of Sciences
 - (2) Two representatives from the Public Health Service, National Communicable Disease Center
 - (3) Six representatives from NASA
- b. An alternative designated by the agency concerned may attend and participate in the meetings of the Committee in the absence of a member, or by invitation.
- c. The Committee Chairman and Deputy Chairman will be the Public Health Service members. The Administrator shall appoint an Executive Secretary from among the NASA members.

4. Functions

- a. The Committee shall advise the Administrator concerning back contamination and the protection of the biological and chemical integrity of lunar samples. In furtherance of this function the Committee is authorized to:
 - (1) Consider and make recommendations concerning proposed quarantine protocols.
 - (2) Review the plans and specifications of the Lunar Receiving Laboratory, and recommend approval of procedures and standards for containment testing.
 - (3) Conduct inspections of the Lunar Receiving Laboratory during its construction, upon its completion, and immediately prior to manned lunar missions.
 - (4) Review and recommend the manner in which lunar astronauts, lunar samples, mission-related equipment, and other lunar exposed material are to be recovered and transported to places of quarantine.
 - (5) Review and recommend approval of quarantine procedures and tests, analyses, and other examinations on lunar astronauts, lunar samples, mission-related equipment, and other lunar exposed material.

- (6) Consider the need for changes in the regulations of governmental agencies, and for additional or changed statutory authority for any government agency.
- (7) Consider such other matters as the Administrator may from time to time determine to be appropriate.
- b. It is anticipated that among the more important functions of the Committee will be that of advising the Administrator as to when and the manner in which astronauts and lunar samples may be released from quarantine.
- c. It is intended that the Committee, in performing the functions assigned to it by this paragraph 4, or otherwise, shall advise the Administrator on matters of policy, rather than on technical details, although the complexities of the problems it will consider will require the examination of technical matters.

5. Subcommittees and Panels

- a. The Committee, at such times and for such purposes as it deems appropriate may establish subcommittees composed of one or more Committee members. The Committee may utilize such a subcommittee in performing any of the functions assigned to it.
- b. The Committee may recommend to the Administrator the establishment of panels to advise the Committee on technical matters and may recommend to the Administrator the persons qualified to serve on such panels.

6. Committee Reports, Findings and Advice

- a. Reports, findings, and advice of the Committee, if agreed to unanimously by the Committee members, shall be submitted to the Administrator on behalf of the Committee by its Chairman. In the absence of unanimous agreement, each member shall submit a report, findings or advice, provided, however, that any two or more members may join together in a report, findings, or advice.
- b. Copies of all papers submitted to the Administrator by the Committee or by any member thereof when acting as a Committee member, shall be forwarded to the heads of the Department of Agriculture, the Department of Health, Education and Welfare, the Department of the Interior, and the National Academy of Sciences.

7. Meetings

- a. Meetings will be held at the call of the Chairman or NASA. The agenda will be formulated or approved by the Administrator or an official designated by him.
- b. All meetings will be conducted in the presence of the Executive Secretary or another designated full-time salaried employee of NASA.
- c. Persons other than Committee members or alternates may attend Committee meetings upon invitation by the Committee.
- d. Minutes will be kept of each Committee meeting. These shall contain as a minimum:
 - (1) A record of persons present.
 - (2) A description of matters discussed and conclusions reached. Copies of all reports received, issued, or approved by the Committee will be made a part of the official record of the meeting and will be incorporated in the minutes by reference.
- e. The accuracy of all minutes will be certified by the Chairman or a NASA representative, other than the Executive Secretary, present during the proceedings.

8. Responsibilities for Release of Information

The NASA Assistant Administrator for Public Affairs or his designee shall function as the principal spokesman for the Committee. However, any member of the Committee may respond directly to queries from members of the public, including representatives of the news media, on matters falling clearly within the cognizance or expertise of the member questioned.

9. Duration of the Committee

The Committee shall cease to exist on March 1, 1968, unless the Administrator determines in writing not more than sixty days prior to such date that the Committee's continued existence is in the public interest. (The Committee has been renewed as of 3/1/68).

Interagency Agreement between the National Aeronautics and Space Administration, the Department of Agriculture, the Department of Health, Education and Welfare, the Department of the Interior, and the National Academy of Sciences on the protection of the Earth's biosphere from lunar sources of contamination

1. Purpose

This agreement, dated as of the 24th day of August, 1967, will confirm existing arrangements between the parties hereto relating to the protection of the Earth's biosphere from lunar sources of contamination, and provides for certain additional arrangements, including the designation of officials authorized to represent and act for each of the parties hereto in matters relating to protection against such back contamination.

2. Definitions

As used in this agreement -

- a. The term "lunar astronaut" means an astronaut who has been exposed, directly or indirectly, to the lunar surface.
- b. The term "back contamination" means direct or indirect contamination of the Earth's biosphere by matter of lunar origin, resulting from a NASA manned lunar exploratory mission.
- c. The term "lunar exposed material" means:
 - (1) matter of any kind, including spacecraft and mission-related equipment, which has been exposed to the lunar surface, and
 - (2) any person, animal, or matter of any kind who or which has been exposed to:
 - (a) a lunar astronaut, or
 - (b) matter which has been exposed to the lunar surface.
- d. The term "regulatory agencies" means the Department of Agriculture, the Department of Health, Education and Welfare, and the Department of the Interior
- e. The term "interested agencies" means the regulatory agencies, the National Academy of Sciences, and NASA.
- f. The term "designated representative" means an official appointed pursuant to paragraph 3.

3. Designation of Officials

The head of each interested agency shall designate an official or officials of such agency each of whom shall be fully authorized to represent and act for it in all matters relating to back contamination. The head of each interested agency may from time to time change the person or persons he has so designated, upon notice to the other interested parties.

4. Interagency Committee on Back Contamination

a. Confirming, and in accordance with previous arrangements made by the heads of the interested agencies, there has been established an Interagency Committee on Back Contamination. The Committee's Terms of Reference are set forth in Attachment A.

b. At least one designated representative of each agency shall serve as a Committee member representing such agency.

c. The report, findings or advice of a Committee member who is his agency's designated representative shall be deemed a statement of the position of such agency, and a report, findings or advice of the Committee, if the members of the Committee unanimously agree to such report, findings or advice, shall be deemed the position of each of the interested agencies.

5. Notification Prior to Agency Action in regard to Back Contamination

a. The head of each regulatory agency, or the agency's designated representative, shall consult with the head or designated representative of each other interested agency prior to such regulatory agency's initiation of any action which may have any effect on any NASA lunar exploratory mission, or on any procedures of the other interested agencies relating to back contamination, unless such action is in accordance with the unanimous recommendation of the agencies represented on the Interagency Committee on Back Contamination.

b. The Administrator of NASA, or NASA's designated representative, shall consult with the head or designated representative of each other interested agency prior to NASA's taking any of the following actions, unless such action is in accordance with the unanimous recommendation of the regulatory agency and National Academy of Sciences members of the Interagency Committee on Back Contamination:

- (1) Adopting or changing procedures in regard to isolation and containment of lunar astronauts or lunar exposed material, if such procedures or changes relate to the prevention of back contamination.
- (2) Adopting, or approving changes in, the plans or specifications, or procedures and standards for the containment testing, of the Lunar Receiving Laboratory.

(3) Adopting or changing procedures relating to the quarantine testing, analyzing, or other examination of lunar astronauts and lunar exposed material, or conducting such tests, analyses, and examinations in a manner other than in accordance with established procedures.

(4) Releasing lunar astronauts or lunar exposed material from quarantine.

- c. (1) Notwithstanding subparagraphs a and b of this paragraph, in the event of any unexpected occurrence which in the opinion of the head of any interested agency, or any designated representative, or a NASA official having cognizance over any aspect of a lunar mission, warrants immediate action not in accord with previously established procedures, such official may, prior to consultation between his agency and any other, take such immediate action as he deems appropriate.
- (2) In the event action is taken pursuant to this subparagraph c, the agency so acting shall, as soon as circumstances permit, notify, by telephonic or telegraphic means, each other interested agency of such action; and thereafter shall promptly submit a detailed report of such action and the justification therefor to each of the other interested agencies.

6. Release of Reports and Other Information to the Public

a. Responsibility and initiative for the release of all public information, including scientific and technical reports, related to lunar astronauts, lunar-exposed material or back contamination resulting from any NASA lunar mission shall be reserved to the Administrator of NASA or his designee, except that any other interested agency may release such information upon approval by NASA.

b. The NASA Assistant Administrator for Public Affairs or his designee shall function as the principal spokesman for the Committee. However, any member of the Committee may respond directly to queries from members of the public, including representatives of the news media, on matters falling clearly within the cognizance or expertise of the member questioned. Except as provided in subparagraph a, any interested agency, upon coordination with NASA, may release, independently or jointly with other interested agencies, information related to the membership and functions of the Interagency Committee on Back Contamination.

7. Funding

It is contemplated that neither the operation of the Interagency Committee on Back Contamination nor any other aspect of this agreement will result in any exchange of funds between the parties hereto,

8. Effective Period

This agreement becomes effective upon the date hereinabove set forth, and may be terminated by any party hereto upon 60 days advance written notice to each of the other parties.

/s/ Frank A. Bogart
National Aeronautics and
Space Administration

/s/ John Bagby, Jr.
Public Health Service
National Communicable
Disease Center

/s/ E. E. Saulmon
Department of Agriculture

/s/ Howard H. Eckles
Department of the Interior

/s/ Wolf Vishniac
National Academy of Sciences

APPROVED:

/s/ James W. Webb
James E. Webb
Administrator
National Aeronautics and
Space Administration

/s/ John W. Gardner
John W. Gardner
Secretary
Department of Health,
Education and Welfare

/s/ Orville L. Freeman
Orville L. Freeman
Secretary
Department of Agriculture

/s/ Stewart L. Udall
Stewart L. Udall
Secretary
Department of the Interior

/s/ Frederick Seitz
Frederick Seitz
President
National Academy of Sciences

Date: August 24, 1967

January 9, 1967
effective dateN A S A

MANNED SPACECRAFT CENTER

MANAGEMENT INSTRUCTIONASSIGNMENT OF RESPONSIBILITY FOR THE PREVENTION OF CONTAMINATION OF THE
BIOSPHERE BY EXTRATERRESTRIAL LIFE1. PURPOSE

To insure that all MSC elements directly involved in the manned lunar missions take the action required to prevent the contamination of the biosphere by extraterrestrial pathogens that could be returned from the lunar surface through either the crews, spacecraft, or lunar samples.

2. BACKGROUND

Federal laws require that all precautionary steps be taken to prevent the introduction of pathogens that are harmful or destructive to human, animal, or plant life. The regulatory responsibility for the execution of these laws has been placed with the Public Health Service of the Department of Health, Education, and Welfare; the Department of Agriculture; and the Department of the Interior. Because of the possibility of the introduction of such pathogens into the biosphere as a result of the manned lunar missions, MSC has the responsibility of taking all necessary precautions as required by these Agencies to prevent such backcontamination.

3. RESPONSIBILITIES

Dr. Charles A. Berry, Director of Medical Research and Operations, is responsible for all efforts at MSC to prevent backcontamination as a result of lunar surface missions. His efforts will be carried out to meet the requirements of the regulatory agencies, and he will be fully responsive to these requirements. In the execution of this duty, he is specifically responsible for the following activities:

- a. Approval of performance requirements and specifications for all systems, subsystems, facilities, and equipment involved in the prevention of backcontamination.
- b. Approval of all procedures developed to prevent backcontamination, including procedures to be employed during the return flight, during landing and recovery, during return of the spacecraft and crew to the Lunar Receiving Laboratory, and during the quarantine period in the LRL.

- c. Certification of the proficiency of the flight crews and ground support personnel in their knowledge of microbiology, their execution of the procedures, and their operation of equipment.
- d. Surveillance where possible during missions and post-flight quarantine of the performance of backcontamination prevention measures and on-the-spot correction of deficiencies.
- e. Post-mission evaluation of the execution and the adequacy of all backcontamination prevention measures and development and implementation of improved procedures.

It is assumed that the regulatory agencies will have representatives in residence at MSC at the time a lunar sample is received. The MSC Director of MR&O will be responsible for certifying to them that all quarantine requirements were carried out in accordance with agreed to procedures.

Within the Medical Research and Operations Directorate, Dr. Walter W. Kemmerer, Chief of the Biomedical Specialties Branch, is responsible to Dr. Berry for the execution of these duties.

The Public Health Service has appointed Dr. G. Briggs Phillips to serve as its representative at MSC. Dr. Phillips' official point-of-contact will be the Director, MSC. Dr. Kemmerer, however, will be the operating level point-of-contact on all matters of concern to the Public Health Service.

The role of the Public Health Service representative will be to keep both Agencies informed of problems of mutual interest, to expedite coordination of efforts in these problem areas, and to aid in communications between programs of both Agencies.

Also at the time of lunar exploration operations, it is expected that the Public Health Service will designate a Quarantine Office. The Quarantine Officer will be responsible for such surveillance of the execution of quarantine procedures as the Public Health Service may require to carry out its regulatory responsibilities.

4. APPLICABILITY

The prevention of backcontamination concerns many MSC organizations since it involves hardware, crew training, the inclusion of certain procedures in mission and flight plans, landing and recovery operations, and, of course, the entire operation of the Lunar Receiving Laboratory. All organizations are expected to successfully execute their respective responsibilities and fully cooperate with Drs. Berry and Kemmerer in the execution of their duties as defined in this instruction.

/s/ George M. Low
(for) Robert R. Gilruth
Director

DISTRIBUTION:

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